

March 10, 2004



Via Electronic Filing
Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: MM Docket No. 99-325

Dear Ms. Dortch:

National Public Radio ("NPR") hereby submits the final report on the field testing of *Tomorrow Radio*sm -- the use of a compatible split data delivery format to add a supplemental audio channel ("SAC") to the iBiquity Digital ("iBiquity") HD Radio system. NPR, the Kenwood Corporation, and the Harris Corporation, with the support of iBiquity and the guidance of consulting engineers Hammett & Edison sponsored the testing. The results of this testing, we believe, establish the efficacy of using the SAC capability of HD Radio to transmit multiple digital audio programming services. As soon as reasonably practicable, therefore, NPR requests that the Commission authorize FM broadcast stations to deploy the necessary iBiquity technology to implement SAC functionality.

Background

By authorizing AM and FM broadcast stations to utilize iBiquity's in-band, on-channel ("IBOC") technology to commence basic hybrid analog and digital service, the *Report and Order* in this proceeding began the transition to digital audio broadcasting. *In the Matter of Digital Audio Broadcasting Systems And Their Impact on the Terrestrial Radio Broadcast Service, First Report and Order*, MM Docket No. 99-325, at ¶¶ 1, 41-43 (Oct. 11, 2002). In so doing, the Commission sagely envisioned a host of potential uses of digital technology to expand and improve radio service to the public, specifically including additional audio programming channels. *Id.* at ¶ 36. Given the evolutionary nature of the iBiquity IBOC technology, the Commission recognized the need to resolve a number of technical matters, including whether and how might stations transmit multiple digital audio programming channels to a meaningful portion of the station's authorized service area without causing harmful interference to other services. See *id.* at ¶¶ 24, 36 & 38. The Commission promised to address these matters as the iBiquity IBOC technology developed. *Id.* at ¶ 36.

Tomorrow Radiosm Testing

Heartened by the Commission's strong endorsement of digital radio, and mindful of the new public services possible via digital audio multicasting, NPR began planning field tests of an FM channel multiplexing enhancement to the IBOC digital FM system authorized in the *Report & Order* in December 2002. The purpose of the testing was to evaluate mobile reception of the supplemental audio channel of the iBiquity system and determine whether it was sufficiently robust to serve the typical analog service area of the host stations. Pursuant to experimental broadcast authorizations, the testing was conducted at NPR Member stations WETA-FM, Washington, DC, WNYC-FM, New York, NY, KALW-FM, San Francisco, CA, and KKJZ-FM, Los Angeles, CA during summer and fall 2003.

Each participating station was outfitted by Harris Corporation with production broadcast transmission hardware. Kenwood Corporation utilized a modification of a pre-existing field testing package to gather performance data over defined mobile test routes. Kenwood also provided prototype production receivers modified to decode the *Tomorrow Radiosm* test version of the iBiquity HD radio. Each station's IBOC transmitting facility included a software modification to the digital exciter to allow *Tomorrow Radiosm*-format transmissions.

The test methodology was presented to the National Radio Systems Committee ("NRSC"), which tested and approved the iBiquity HD Radio system, for its review and comment. The NRSC also received periodic reports throughout the project. The final report was submitted to the NRSC at its January 9, 2004.

The *Tomorrow Radiosm* testing confirmed the viability of subdividing the HD Radio 96 kbps data stream into multiple data streams for purposes of broadcasting audio programming. In these tests, the 96 kbps Main Audio Program ("MAP") data stream was divided into a 64 kbps MAP channel and a 32 kbps SAC channel. The 64 kbps MAP channel behaved identically to the standard 96 kbps MAP channel, featuring blend-to-analog when the digital signal is lost. The 32 kbps SAC channel does not have an analog program backup and mutes once beyond the coverage range.

Based on the test data, Hammett & Edison concluded, to a certainty of 95%, that the *Tomorrow Radiosm* SAC service area would reach a typical FM station's 70 dBu to 60 dBu service area. In the case of WNYC-FM, New York, NY, for instance, the testing yielded a SAC service area containing 15,747,274 persons, which represents 129% of the population within the station's projected 70 dBu contour, 103% of the population within the projected 60 dBu contour, and 93.6% of the population within the projected 54 dBu contour.

Observations and Conclusion

NPR, its partners in the *Tomorrow Radio*sm project and the 4 participating public radio stations in Los Angeles, San Francisco, New York City and Washington, D.C., took seriously the Commission's encouragement to develop innovative offerings for digital broadcast operations, including multiple audio programming channels. Public radio is grateful to the Commission for providing experimental license authority to the 4 test market stations. The Commission's assistance in this area, combined with the positive test results, has led to significant and growing interest in the use of supplemental audio channel capability. In the very near future, public radio stations from virtually every state in the nation will be prepared to begin digital broadcast operations that, with the Commission's consent, will include the supplemental audio format.

The driving force behind public radio's digital transition is not just the improved audio quality and reduced interference, but the expanded public service and programming opportunities demonstrated and proven by the *Tomorrow Radio*sm project. Terrestrial radio, the most ubiquitous, most accessed content delivery medium in the United States, is poised to reinvigorate its service capabilities through digital technology and supplemental audio enhancements.

The "real world" testing described in the attached report validates the technical capability of the iBiquity HD Radio system to offer multiple digital audio channels. Moreover, we are heartened by the highly positive subjective listening tests recently completed using the new HDC audio coder and submitted to the NRSC. These results validate our own assessments that SAC operations will present a fully viable delivery system for new public service channels. Finally, because the *Tomorrow Radio*sm functionality is a technical matter of subdividing the HD Radio digital data stream, NPR anticipates that existing Commission public interest requirements governing FM broadcasting would apply to FM stations electing to broadcast multiple audio channels.

Accordingly, NPR respectfully requests the Commission to authorize FM stations to implement the SAC capability of HD Radio, either in the context of a further notice of proposed rulemaking or based on consideration of SAC alone, but, in any event, as soon as possible and without requiring new station licensing.

Sincerely,

Michael Riksen
Vice President for Government Relations

Attachment